

Salmonella in the United States – Current Concerns

Herbert W. Ockerman and Lopa Basu

The Ohio State University, Columbus, OH, USA.

ockerman.2@osu.edu

Abstract – Salmonella is responsible for food poisoning, gastroenteritis, typhoid fever as well as other food illnesses. Generally humans become infected through consuming contaminated food or water. Symptoms show up 12 to 24 hours after infection. Salmonellosis causes fever, abdominal cramps or diarrhea which usually last for about a week. High risk patients such as infants or elderly individuals with compromised immune systems can result in infections. Prevention can be aided by washing hands, separating raw food from cooked foods, following recommend temperatures for cooking, and rapid chilling.

Key Words – Salmonella, United States, microbiology, food poisoning, food safety

Sources of Contamination

Humans, animals (including birds, pets, poultry, eggs, pork, beef, reptile, amphibians and their feces) can all be infected. The animals can get salmonella by eating contaminated food or water or coming in contact with other infected animals or humans. Fruits and vegetables can also be a source of contamination often due to infected animals in the vegetable fields or due to irrigation with infected water. To make it worse many infected animals and sometimes humans appear normal and infected food does not have an off odor or color. To reduce the spread of contamination hands should be thoroughly and frequently washed after handling sources of contamination. This is critical if the individual is engaged in food preparation.

Common types of Salmonella in the U.S.

These include Salmonella enteritidis which generally causes gastroenteritis and S.typhimurium (Figure 1) which causes typhoid fever. Both strains are contracted by consuming contaminated food or water or by handling infected animals. The typhimurium strain can also be contracted through handling an infected individual's blood.

Figure 1. Salmonella serotype Typhi bacteria(Source: CDC)



Effects of Salmonella infection

Typical symptoms include diarrhea, abdominal cramps and fever that last for 4 - 7 days. However these same symptoms are also caused by other infections so it is difficult to identify the cause. Stool or blood tests are therefore necessary for confirmation. In a few cases infections can travel to other parts of the body. These are rare but can be severe and life-threatening.

Number of Cases in U.S.

The Center of Disease Control estimates that there are ~1.2 million cases/year, resulting in ~400 deaths/year which makes Salmonella the deadliest food born disease. Salmonella reported infection rate in the U.S. by state is indicated in Figure 2.

Prevention

All of the domestic and international organizations agree that:

1. Proper food preparation and cooking can kill Salmonella
2. Wash hands before and after handling food
3. Wash hands after handling animals
4. Keep separated cooked and raw foods and particularly those that are not going to be cooked prior to consumption. Also don't cross contaminate by utilization of dishes and food

preparation tools, cutting boards and sinks that may contain Salmonella from its previous usage.

5. Cook to a safe internal temperature.
 - a. Poultry - 165°F (74°C)
 - b. Eggs - 160°F (72°C) or until yolk is solid
 - c. Beef and pork - 160°F (72°C)
 - d. High quality beef steaks (not needle or blade tenderized) - 145°F (63°C)
6. Avoid unpasteurized milk
7. Avoid raw eggs in any food including sauces
8. Avoid under cooked French Toast

Conclusion

Salmonella is responsible for food poisoning and food illnesses but can be prevented by following food safety recommendations and proper cooking.

References and Additional Reading

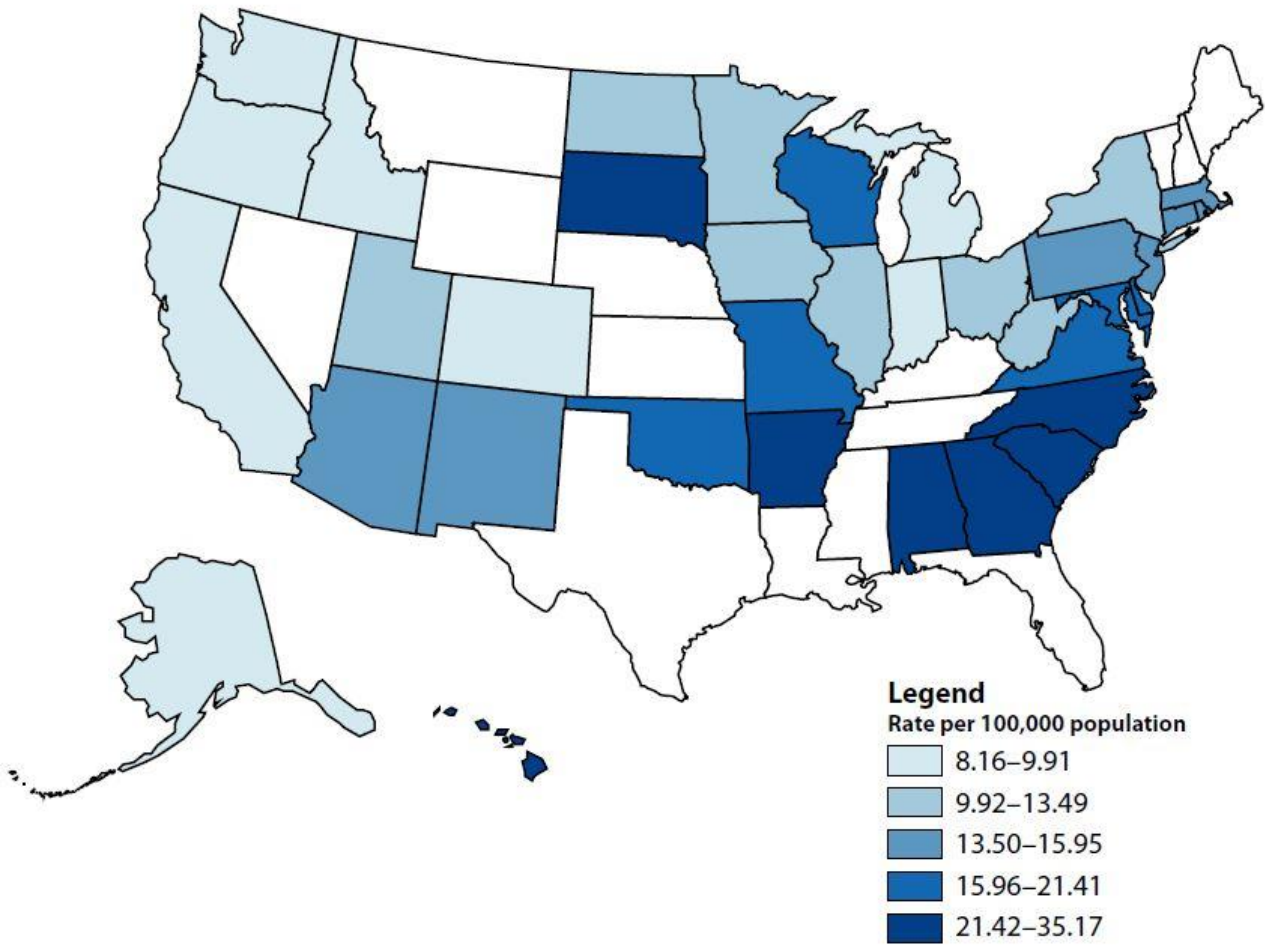
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Figure 2. Salmonella infections (all serotypes), by state, United States, 2011



*Source Center for Disease Control and Prevention (CDC)